SACHITA NISHAL

sachita.nishal@gmail.com ◇ GitHub ◇ Website

EDUCATION

Birla Institute of Technology and Science (BITS), Pilani, India *Aug '16 - Present*
Bachelor of Engineering (Honours), Computer Science
Current GPA : 7.83

Divine Child High School, Surat *Graduated May '16*
Central Board of Secondary Education (Science) Class 12 Overall Percentage: 97.2

RESEARCH PROJECTS AND INTERNSHIPS

Research Assistant, Northwestern University [GitHub] *July '19 - Ongoing*

- Working under Dr. Luis Amaral to understand how creative ideas in films diffuse and evolove over time, and how they influence each other.
- Currently scraping and cleaning data from TV Tropes to use it to generate complex networks of tropes from films, and subsequently analyse the properties of these networks.

Research Intern, Indian Institute of Science Bangalore [GitHub] *Dec '18 - May '19*

- Worked under Dr. Rajiv Kumar Chaturvedi and Dr. Jaideep Joshi to predict burnt area from forest fires, using the Global Fire Emissions Database
- Designed Artificial Neural Networks (ANN) and Long Short Term Memory (LSTM) models for prediction, and compared their performances over the dataset.

Undergraduate Study Project, BITS Pilani (Goa) [GitHub] *Jan '18 - Dec '18*

- Worked under Dr. Sukanta Mondal to study network biomarkers and machine learning algorithms for disease classification.
- Pre-processed multi-class genetic expression data using Shannon's Entropy combined with PCA, and designed an ANN for the classification of lung cancer types.

Research Intern, Indian Institute of Technology, Madras [Report] *May '18 - July '18*

- Worked under Dr. Karthik Raman on using machine learning techniques for the prediction of protein-ligand binding affinities, for applications in drug design.
- Carried out a study of pre-existing methods that input 3D structural data of ligand-receptor complexes into Convolutional Neural Networks (CNNs) for predictions.
- Replicated several types of regression-based and classification-based CNNs from papers, using Tensorflow and PyTorch.

Undergraduate Study Project, BITS Pilani (Goa) [Poster] *Aug '17 - Dec '17*

- Worked under Dr. Toby Joseph to simulate the workings of the inner ear in humans, and reproduce its features qualitatively.
- Modelled the inner ear hair cell as an RC circuit; the basilar membrane as a nonlinear damped oscillator, and neurotransmitter release at synapses as a Poisson process. Used MATLAB.

Research Intern, IISER, Pune [GitHub] *May '17 - July '17*

- Worked under Dr. Sutirth Dey to create evolutionary models of randomised genetic and epigenetic mutations in Wright-Fischer populations.
- Replicated a quantitative model in Python to account for mutations in gene pool. Graphed the resulting evolutionary dynamics to further the understanding of interplay of genetic and epigenetic

factors in population fitness.

AWARDS AND SCHOLARSHIPS

Summer Internship Award (SIA) 2018 *May '18*

- Received from BITS Pilani to pursue independent research activities in May-July 2018
- Approximately 8% of applicants were selected, based on scholastic excellence, research potential and student proactivity

LIST OF PUBLICATIONS AND POSTERS

Minimal Modelling of Primary Auditory Neuron Behaviour Synapsing to Inner Hair Cells

- Project poster presented by Project In-Charge Dr. Toby Joseph at the 5th Complex Dynamical Systems and Applications Conference (CDSA 2017) at IIT - Guwahati

RELEVANT COURSEWORK

Courses taken at BITS Pilani:

Probability and Statistics
Linear Algebra and its Applications
Data Structures and Algorithms
Neural Networks and Fuzzy Logic

Courses taken on MOOC platforms:

Neural Networks and Deep Learning [certificate]
Structuring Machine Learning Projects [certificate]
Improving Deep Neural Nets: Hyperparameter Tuning, Regularization and Optimisation [certificate]
Convolutional Neural Networks [certificate]
Introduction to Genetics and Evolution [certificate]
Natural Language Processing with Deep Learning [ongoing]
Social and Economic Networks: Models and Analysis [ongoing]

TEACHING, MENTORING AND LEADERSHIP

Teaching Assistant for Environment, Development and Climate Change *Aug '18 - Dec '18*

- Assisted Dr. Rajiv Kumar Chaturvedi, BITS Pilani, Goa
- Designed and helped to evaluate assignments to gauge how students understood issues concerning climate change and climate policy in India [certificate]

Editor and Speaker for The BITS R&D Blog, BITS Pilani, Goa *Jan '18 - Present*

- Part of the student team that created and maintains this public blog. We write articles and give short talks which detail the technical research endeavours of BITS students and alumni.

SKILLS AND ADDITIONAL QUALIFICATIONS

Programming Languages: Python 3, R, Java, C/C++, MATLAB
Libraries/Tools: Tensorflow, PyTorch, Numpy, Pandas, Keras, Scikit-Learn, BeautifulSoup, Matplotlib, Seaborn, Latex